

The image paths of the first, second, third and fourth off-axis projectors **86, 88, 90, 92** can be compacted by folding the projection display system **84** using reflective surfaces to reduce the geometry of the system in a similar manner to that shown above with respect to the projection display systems **72, 78, 80, 82**. Referring to FIGS. **10A** and **10B**, an example of a folded projection display system **106** is shown, wherein elements common to both systems **84, 106** are identified by the same reference characters. The first and third off-axis projectors **86, 90** are positioned in alignment with one edge of the screen assembly **94**. The projectors **86, 90** face each other with the projector **86** facing down and the projector **90** facing up. The second and fourth off-axis projectors **88, 92** are positioned in alignment with the opposite edge of the screen assembly **94**, also facing each other with the projector **88** facing down and the projector **92** facing up. First and third images **108, 110** are directed from the first and third off-axis projectors **86, 90** onto first and third reflectors **112, 114**, which redirect the first and third images **108, 110** onto a fifth reflector **116** and onto the back face **98** of the screen assembly **94**. Second and fourth images **118, 120** are directed from the second and fourth off-axis projectors **88, 92** onto second and fourth reflectors **122, 124**, which redirect the second and fourth images **118, 120** onto a sixth reflector **126** and onto the back face **98** of the screen assembly **94**.

As in the case of the folded twin projector systems **72, 78, 80, 82**, the on-axis edges of the projected images of the present folded four projector system **106** have a nearly normal orientation relative to the center axes of the screen assembly **94** to maintain the on-screen image quality. The folded projection display system **106** exhibits good mechanical stability. The position of the projected images onto the screen assembly **94** is easily adjustable and the folded projection display system **106** has a high degree of compactness.

Although each embodiment of the present invention shown above employs a rear projection screen assembly, it is apparent to the skilled artisan that the multiple off-axis projectors can alternatively be employed with a conventional front projection screen in accordance with the present invention.

While the foregoing preferred embodiments of the invention have been described and shown, it is understood that alternatives and modifications, such as those suggested and others, may be made thereto and fall within the scope of the invention.

I claim:

1. A projection display system comprising:

a screen assembly including a display screen, said screen assembly having a center axis segmenting said screen assembly into a first segment and a second segment;

a first off-axis projector producing a first image directed via a first image path onto said first segment of said screen assembly, wherein said first image intersects said center axis at a substantially normal angle; and

a second off-axis projector producing a second image directed via a second image path onto said second segment of said screen assembly and interfacing said first image at said center axis, wherein said second image intersects said center axis at a substantially normal angle.

2. The projection display system recited in claim 1, wherein said first off-axis projector is positioned substantially adjacent to said second off-axis projector.

3. The projection display system recited in claim 1, wherein said first and second off-axis projectors define an axis of intersection substantially normal to said center axis.

4. The projection display system recited in claim 1, wherein said center axis is a vertical center axis.

5. The projection display system recited in claim 1, wherein said center axis is a horizontal center axis.

6. The projection display system recited in claim 1, wherein said screen assembly further includes means positioned in said first and second image paths for receiving and straightening said first and second images.

7. The projection display system recited in claim 1, wherein said screen assembly further includes a Fresnel lens positioned in said first and second image paths.

8. The projection display system recited in claim 7, wherein said display screen has a front surface and a rear surface and said Fresnel lens is positioned adjacent to said rear surface.

9. The projection display system recited in claim 7, wherein said Fresnel lens substantially covers said rear surface.

10. The projection display system recited in claim 1, wherein said first and second off-axis projectors are positioned behind said screen assembly.

11. The projection display system recited in claim 1, wherein said first and second off-axis projectors are positioned in front of said screen assembly.

12. The projection display system recited in claim 1 further comprising at least one reflector positioned in said first or second image path to redirect said first or second image such that said first or second image path is folded.

13. The projection display system recited in claim 1, wherein said center axis is a vertical center axis and said screen assembly further has a horizontal center axis, said vertical and horizontal center axes segmenting said screen assembly into a first quadrant, a second quadrant, a third quadrant and a fourth quadrant, said first image directed onto said first quadrant and said second image directed onto said second quadrant, said system further comprising;

a third off-axis projector producing a third image directed via a third image path onto said third quadrant, said third image intersecting said vertical center axis at a substantially normal angle; and

a fourth off-axis projector producing a fourth image directed via a fourth image path onto said fourth quadrant and interfacing said third image at said vertical center axis, said fourth image intersecting said vertical center axis at a substantially normal angle.

14. The projection display system recited in claim 13, wherein said first and third images intersect said horizontal center axis at a substantially normal angle and said first image interfaces said third image at said horizontal center axis.

15. The projection display system recited in claim 13, wherein said second and fourth images intersect said horizontal center axis at a substantially normal angle and said second image interfaces said fourth image at said horizontal center axis.

16. A projection display system comprising:

a screen assembly including a display screen and a Fresnel lens, said screen assembly having a center axis segmenting said screen into a first segment and a second segment;

a first off-axis projector positioned behind said screen assembly producing a first image directed via a first image path onto said first segment of said screen assembly, wherein said first image intersects said center axis at a substantially normal angle; and

a second off-axis projector positioned behind said screen assembly producing a second image directed via a